

PENGRABRIDGE  
(Fall Creek Bridge)  
Spanning Fall Creek, Place Road (CR 480)  
Jasper vicinity  
Lane County  
Oregon

HAER OR-119  
*OR-119*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
U.S. Department of the Interior  
1849 C Street NW  
Washington, DC 20240-0001

## HISTORIC AMERICAN ENGINEERING RECORD

### PENGRA BRIDGE (Fall Creek Bridge) HAER No. OR-119

Location: Spanning Fall Creek at bypassed section of Pengra Road  
(County Road 480, also known as Place Road), Jasper, Lane  
County, Oregon  
UTM: 10.512389.4868123, Lowell, Oregon, Quad.

World Guide #: 37-20-15

Structural Type: Howe through truss covered bridge

Date of Construction: 1938; rehabilitated 1994

Designer: Oregon State Highway Commission

Builder: Lane County; A.C. Striker, County Engineer

Owner: Lane County, Oregon

Previous Use: Vehicular bridge

Present Use: Vehicular bridge

Significance: Built in 1938 to replace an earlier bridge at this site, Pengra Bridge illustrates the style of covered bridge adopted by Lane County during the administration of A.C. Striker (1885-1962), Lane County's Superintendent of Bridges from 1928 to 1950. Pengra Bridge contains two of the longest timbers ever hewn for an Oregon bridge.

Historian: Researched and written by Lola Bennett, September 2003

Project Information: The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is administered by the Historic American Buildings Survey/Historic American Engineering Record, a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

## **Chronology**

- 1805 America's first covered bridge built at Philadelphia
- 1840 William Howe patents Howe truss
- 1846 Elijah Bristow emigrates from Virginia and stakes first land claim in Lane County, Oregon
- 1849 Oregon Provisional Government enables county governments to build bridges
- 1851 Lane County established; population 150
- 1853 B.J. Pengra settles near this site
- 1859 Oregon becomes 33rd state admitted to the Union
- 1874 Lane County's first covered bridge built at Springfield
- 1880 Lane County population 1,200
- 1904 Lane County lays out Pengra Road and erects first bridge at this site
- 1913 Oregon State Highway Commission established
- 1915 Lane County builds covered bridges against the advice of state highway engineers
- 1917 State of Oregon begins building covered bridges in the wake of WW I steel shortage
- 1936 Oregon has more than 300 covered bridges
- 1938 Present bridge erected at this site
- 1946 Oregon has 250 covered bridges
- 1950s Lane County begins preserving covered bridges
- 1954 Oregon has 149 covered bridges
- 1979 Pengra Bridge bypassed
- 1979 Covered Bridge Society of Oregon organized
- 2002 Oregon has 45 covered bridges
- 2003 Pengra Bridge recorded by the Historic American Engineering Record

## Introduction

Oregon's first documented covered bridge was built at Salem in 1862.<sup>1</sup> In a region of plentiful virgin timber, wooden bridges were a practical, economical solution to crossing rivers, and during the next three decades, hundreds of covered bridges were built. Floods, however, were an ongoing threat. When large numbers of covered bridges were destroyed by floods in the 1880s and 90s, it encouraged the growing trend toward metal bridges. The late nineteenth and early twentieth centuries saw an enormous reduction in Oregon's covered bridge population. Ironically, just as the horse-and-buggy era came to a close, and signs of "progress" were everywhere, a new era of covered bridge building began to unfold.

In 1913 the Oregon State Highway Department was created and charged with establishing and maintaining a system of roads and bridges throughout the state, including those financed by the counties. Among the Department's first tasks were publishing a manual of bridge specifications and making bridge design services available to county engineering departments. State engineers initially favored concrete and steel bridges, but eventually drew up standardized plans for timber trusses, under pressure from the counties. This benefited the local lumber industry and proved to be a sound economic measure during the steel shortages of the world wars.

Some covered bridges were built on state highways between 1918 and 1925, but the majority were built on county roads in the 1920s, 30s and 40s. In 1954, Benton County's Irish Bend Bridge became the last covered bridge in the United States built for purely economic reasons, and Oregon's second covered bridge era came to a close. From a peak of about 300 covered bridges in 1938, Oregon's covered bridge population steadily declined in the mid-twentieth century. By the 1960s, there were only 90 covered bridges left in the state. In 1979, the Covered Bridge Society of Oregon was formed to raise awareness and help preserve these historic structures. Cooperation from the Oregon State Highway Department and county governments has resulted in the rehabilitation and preservation of 45<sup>2</sup> covered bridges in Oregon.

## Description

Pengra Bridge is a single-span, 120-foot Howe through truss covered bridge on concrete piers. There is a timber trestle approach at each end. The bridge is 25' wide.

Each truss has six 15-foot panels and two end panels. The chords are single sticks, measuring 16"x18"x126' (lower) and 14"x18"x96' (upper). The chords are connected with vertical steel rods at each panel point. The rods pass through the chords and are secured at their ends with plates and nuts. There is a pair of diagonal braces within each panel. The size of the braces increases from 10"x10" at center span to 14"x18" at the ends of the truss. The two center

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<sup>1</sup> Dwight A. Smith, James B. Norman and Pieter T. Dykman, *Historic Highway Bridges of Oregon*, revised edition (Portland: Oregon Historical Society Press, 1989), p. 29.

<sup>2</sup> In 1995 Oregon had 45 authentic covered bridges, that is, housed, load-bearing, single-span wooden truss bridges. Four additional bridges are housed by have girders, slabs or steel trusses as their main support system.

panels have diagonal counterbraces. The diagonal members bear on wooden angle blocks bolted to the chords.

The deck system consists of wooden floor beams, stringers and decking. 14"x21" wood floor beams are hung transversely below the lower chords. Sixteen lines of wooden stringers run longitudinally on top of the floor beams. Plank decking is nailed on top of the stringers.

The bridge is braced overhead with 10"x10" tie beams notched to the upper chord at each panel point. Upper lateral bracing is 6"x6" sticks crossing between the tie beams. 8"x8" sway braces are bolted to the braces and tie beams. Wooden 2"x4" rafters are spaced 18" apart and supported on blocks on the upper chord. The gable roof is covered with wooden shingles nailed to 1"x4" purlins on the rafters.

The bridge has a wood-shingled gable roof and is covered with board and batten siding almost to the eaves. The arched portals have shelter panels and are unornamented. The bridge is painted white. There is a 23'x6' window with a hood on the downstream side.

The bridge carries one-way traffic and has a posted weight limit of 30 tons.

## History

In 1853, pioneer B.J. Pengra<sup>3</sup> settled near this site on Fall Creek. The locality known as "Pengra" became a station on the Cascade Line of the Southern Pacific Railroad in the late 1800s, but that line was seldom used and eventually abandoned. In 1904, Lane County laid out Pengra-Unity Road (now Place Road) along the old railroad grade and built a 193-foot Howe truss bridge at this site.

The present covered bridge was built by the county in 1938. Oregon State Highway Commission photos show the old and new bridges standing side by side during construction. The bridge was bypassed in 1979, but continues to carry local traffic.

## Design

In 1840, Massachusetts millwright William Howe (1803-1852) patented a parallel-chord truss with vertical iron tension rods and diagonal wooden braces and counterbraces crossing within each panel. By substituting adjustable iron rods for the wooden posts of the Long truss (1830), Howe was able to overcome the inherent difficulty of creating tension connections in wood and simplify the process of erecting and repairing bridges. Used extensively in the United States and Europe, primarily for railroad bridges, the Howe truss was endorsed by the American Society of Civil Engineers as "*the most perfect wooden bridge ever built.*"<sup>4</sup> The Howe truss

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<sup>3</sup> B.J. Pengra became surveyor general of Oregon in 1862.

<sup>4</sup> American Society of Civil Engineers, *Transactions* (1878): 340.

successfully made the transition to the construction of all-metal bridges, but was eventually superseded by the all-metal Pratt truss (1844).

## Builder

In 1915, Lane County became the first Oregon county to reinstate covered bridges. They did so against the recommendations of state highway engineers, arguing that wooden bridges supported the local economy, were less expensive to build and would last as long as steel bridges if properly covered.<sup>5</sup> Lane County's early covered bridges had square portals and weatherboarding to the eaves. During Superintendent A.C. Striker's<sup>6</sup> administration, the county switched to a wider style of housing with arched portals and openings below the eaves. One-piece chords, like those used in Pengra Bridge, are also typical of Lane County covered bridges. Lane County was one of the last counties to stop building covered bridges in the 1940s. Today the county has 17 surviving examples, most of which are still open to traffic.

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<sup>5</sup> "Says Wooden Bridges will Stand the Traffic," *Morning Register* (Eugene, Oregon) 5 January 1915: 8. and "Will Erect Wooden Bridge," *Morning Register* (Eugene, Oregon) 7 April 1915: 5.

<sup>6</sup> Arthur Clayton ("A.C.") Striker (1885-1962) served as Lane County's Superintendent of Bridges from 1928 to 1950, during which time the majority of Lane County's surviving covered bridges were built.

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